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INTERNET-BASED PSYCHOLOGICAL TESTING AND ASSESSMENT

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Editors' Note: In the following chapter, the authors describe the many ways in which online assessment tools revolutionize the field. The uses of online assessment for psychological testing, clinical diagnosis, and self-assessment are explored. Advantages and disadvantages, as well as legal and ethical issues that are related to assessment online, are discussed.

Benjamin had been unhappy for a while. He experienced trouble sleeping and had generally felt unhappy and unmotivated. Everything seemed to keep going wrong for him, and there was nobody he felt he could turn to for help. He was troubled by what he was experiencing, and wondered if there was something wrong with him, but it had not occurred to him to seek professional help. One evening, while surfing the Web, he accidentally came across a link to a self-help¹ site that looked interesting. At the site, he filled in a short questionnaire called a "Depression Screening Quiz" and was informed that he might be suffering from clinical depression and should consult a mental health professional about it.

Sangeeta was desperate. She had no idea what was wrong with her—she couldn't get any work done, felt that she was useless, and just spent all night playing computer games and messing around on the Internet instead of writing the report she should have finished last week. On impulse, she typed "am I depressed?" into www.ask.com and followed a sponsored link labeled

¹<http://depression.about.com>.

“Are You Depressed? You could have a chemical imbalance. Take the self-test and see.” This led to a page² that seemed to be mainly advertising proprietary remedies. She followed a link to a simple self-test, which presented a list of feelings and instructed her to follow another link if more than a certain number applied to her. She thought they did, so she followed the link to a page that told her she would benefit from buying certain dietary supplements. Now, where was her credit card?

Lars was reading one of his favorite online discussion forums when he came across a message posted by a psychologist halfway across the world, looking for people to take part in a study on online counseling. This involved anonymously filling out some online questionnaires before participating in a course of email exchanges and filling out the questionnaires again afterward to see whether there had been any changes. He thought it sounded interesting, so he emailed the psychologist to let her know he would like to take part.

Dr. Jones, an experienced psychologist with a busy caseload, had just met a new client for a brief initial consultation. As part of her normal assessment procedure, she liked to administer a comprehensive battery of psychological tests (personality, ability, and clinical screening measures). However, this was very time-consuming, so she had adopted a new technique. She gave the client a Web address and asked him to visit it and complete the questionnaires there in his own time. The website Dr. Jones referred the client to was maintained by a test publisher who offered this service to subscribed clinicians. Later that evening, the client visited the site, at his own convenience. When Dr. Jones arrived at work the next morning, she found a full psychological assessment report on the client had been automatically generated and emailed to her. She used it to plan her next session with the client and to define the issues she wanted to follow up in her assessment of his situation.

These (fictional) scenarios are based on materials found on the Internet at the time of writing this chapter, and represent a few of the ways in which people might come into contact with Internet-based psychological assessment procedures. They illustrate some of the potential uses of such assessments, as well as some of the problems that may be associated with their use. The purpose of this chapter is to describe the principles and different techniques of online assessment, the reasons why one might want to do it, and important issues that anyone involved in online psychological assessment needs to be aware of.

There are numerous contexts in which online assessments may take place, and several different types of assessment procedures. In their simplest forms, Internet-based psychological assessments may take the shape of a Web page on which the items of a traditional paper-and-pencil

²<http://add-becalmd.com/13242>.

questionnaire are represented as a computerized form. Respondents may view and complete this form using browser software such as Internet Explorer or Netscape. Having answered all the questions, respondents then typically click on a button that results in their data being transmitted to a psychologist, or being automatically scored and some form of feedback being presented.

Such Internet-based questionnaires may be used for a variety of purposes by a variety of people. A number of different types of questionnaires are used—in addition to simple tick-the-appropriate-box-style instruments—and some assessment procedures have been used that do not rely on questionnaires at all. In the sections that follow, we outline some of the potential uses of online assessments, the types of assessment procedure available, the advantages conferred by using them, and also disadvantages and ethical and legal issues that need to be considered.

PURPOSES OF ONLINE ASSESSMENT

Internet-assisted assessment is used for various needs and purposes, which can be classified into three major categories: psychological evaluation, psychotherapeutic diagnostics, and self-exploration and awareness.

PSYCHOLOGICAL EVALUATION

Psychologists are often asked to evaluate—or assist in the evaluation procedures of—a person's various characteristics, usually in relation to classification or selection processes (Anastasi, 1997). The assessment usually includes factors relating to personality traits, abilities and special aptitudes, attitudes and values, and sometimes special dimensions. The Internet has become a very efficient professional source of assistance to psychologists who wish to engage in evaluation, because it provides continuously updated, rich information about assessment procedures (e.g., tests, assessment centers, interview techniques), as well as online devices that might be used—for free or for a fee—by professionals. Although both information and tools are available offline, the Internet makes them available in a much more accessible way, to any interested professional, at any time of need. In addition, online portals, as well as organizations (e.g., companies, publishers, universities, research institutes) provide ongoing, usually continuously updated information about assessment devices, so that professionals have a quick, convenient way to find what might suit their professional needs, a channel that is much more efficient than traditional resources, such as the *Mental Measurements Yearbook*.

Furthermore, the Internet makes it possible to assess people very efficiently through the use of various computerized procedures, unlike the manual, human-tiring activities used in traditional assessments. Research

studies consistently have reported that online testing produces very similar psychological findings when compared with traditional paper-and-pencil testing (see reviews by Barak & English, 2002; Sampson, 2000; Wall, 2000). Online psychological evaluation has been found to be successful in a variety of assessment areas, including various measures of personality (e.g., Buchanan, 2001; Cronk & West, 2002; Fouladi et al., 2002; Kelly & Jugovic, 2001; Pettit, 2002), integrity (Jones et al., 2002a), career- and work-related measures (Gati & Saka, 2001; Gore & Leuwerke, 2000; Oliver & Chartrand, 2000; Oliver & Zack, 1999), online behavior (Riva, Teruzzi, & Anolli, 2003), behavior checklist (Knapp & Kirk, 2003), abilities (Mooney, 2002), and neuropsychological assessment (Schatz & Browndyke, 2002). It should not, however, be assumed that all psychometric questionnaires will provide valid assessments on the Web, or that the psychometric properties of online versions of questionnaires will remain the same as offline versions. Although most of the research to date has indicated that online questionnaires can be valid, there are reports of instances where factor structures and mean scores have been found to differ (see, e.g., Buchanan, 2001; Buchanan, 2002; Buchanan, 2003; Buchanan et al., 2002a; and other work cited later in this chapter). The most appropriate interpretation of the body of work that currently exists may be that online questionnaires can be (and usually are) psychometrically acceptable, but that this must be empirically demonstrated rather than assumed. One should never just place a test online and expect that it will be the “same test” as it was in paper-and-pencil format.

PSYCHOTHERAPEUTIC DIAGNOSTICS

Counselors who wish to take advantage of the Internet might find it very useful to obtain assistance from online procedures when assessment is desired. Clients may be guided to engage in online testing—provided by computer stations at a clinic or at a client’s home—at a time of their convenience, without the necessity of paper forms, scoring keys, or test administrators. Clients may take various types of tests—personality inventories, career-interest questionnaires, or intellectual ability tests—through the Web and receive immediate, accurate results. Moreover, the results can be provided simultaneously to the clients’ counselors, too. Test results may be linked directly to relevant online information resources, making the results much more meaningful and applicable for test-takers. Counselors may benefit from having their clients engage in online assessment procedures in several ways. First, quite a few counselors may free themselves from the need to administer tests (themselves or through the help of assistants). Second, counselors receive the accurate results just as soon as they are available, directly into their personal computers. Third, automated interpretation, of a single test or of a whole (online) assessment battery, can be provided in many cases, saving time and obviating subjective biases on the

counselor's part. Fourth, all scores (or even item responses) can conveniently be saved and archived for any future use.

Online tests may also be used efficiently as mental health-screening devices to identify psychological problems prior to or as an adjunct to medical procedures, which require initial and immediate diagnosis (Hill et al., 2002). Another example of the practical diagnostic use of online assessment is the successful use of an online measure intended to assess a youth's independent living potential (Bressani & Downs, 2002). A special case in exploiting the Internet for effective diagnosis has to do with sex-function problems (Ochs et al., 2002), for which openness and candidness are necessary, but might be jeopardized in a face-to-face (f2f) interaction needed for assessment. Also, Internet communication channels can be used for the delivery of test interpretation. Jones et al. (2002b) showed that interest inventory interpretation can be conducted effectively with test-takers over text chat accompanied with video.

SELF-EXPLORATION AND SELF-AWARENESS

The Internet is loaded with psychological and pseudopsychological tests and questionnaires that anyone may take for free or for a fee: intelligence tests, personality measures, vocational interest inventories, and other psychological scales. People may take such tests for their own self-exploration and self-awareness, to know themselves better, to obtain answers to personal questions, to help themselves in making choices, or just for the sake of curiosity. People may thus obtain psychologically relevant information on themselves in almost any area and, in principle, make good use of this information. These experiences, which are becoming convenient and normative because of the Internet, should be considered human advancement, as they foster career development, personal development and maturity, and decision-making in various areas. Thus, the tests (online or offline) are usually considered an inseparable part of psychological self-help (Tucker-Ladd, 2000). The ease of using the Net, its normativeness, and indeed its excessive use—related to the “Penta-A Engine” (Barak & Fisher, 2002) of availability, accessibility, affordability, acceptability, and aloneness—has brought about a significant increase in the usage of psychological tests for personal purposes, thereby supposedly contributing directly to valuable personal growth. This assertion, however, depends upon tests' validity as well as the test-takers' effective assimilation of the meaning and implications of the results. A good example of the use of online testing for self-awareness was provided by Cunningham et al. (2000), who developed a brief Internet-based self-assessment procedure that provided normative feedback (by gender and age group) to respondents in regard to their drinking habits. Also in drinking assessment, Miller et al. (2002) found that Web-based measures of drinking habits were as reliable and valid as were paper-and-pencil measures.

TYPES AND METHODS OF ONLINE PSYCHOLOGICAL TESTING

Like traditional psychological testing, online testing is characterized by multiple methods. Naturally, objective testing techniques (see Anastasi, 1997), such as multiple-choice tests, are the most commonly published type on the Internet, because they can mechanically and automatically be scored without direct human intervention. However, despite this clear preference, other testing methods, including projective techniques and the open-ended format, are possible and available on the Net.

The first multiple-choice tests to be published on the Internet were those that measured intellectual abilities and they became very common, apparently because of the right-or-wrong nature of the test items. Several factors should be considered, however, when referring to these tests. First, these tests should be professionally developed, following clear scientific and ethical guidelines and based on common, empirically based psychometric considerations. Many online tests, however, may be amateur, developed and published—without an established professional basis—by anyone who knows how to create a Web page. Second, online tests may be highly technology-enhanced in a way that takes advantage of advanced computer applications, including the rich use of pictures and sound; they may be highly interactive, allow time keeping, and employ complicated scoring techniques; at the other extreme, such online tests might be very simple, using only text, and be scored manually.

Another type of assessment that is common on the Net is that of personality and attitudes. Here, too, using a response format of rating scales (i.e., Yes/No, numerical, or text-based) makes computer-software automatic scoring easy and fast. There are also various levels of sophistication and exploitation of Internet capabilities with these questionnaires. In this case, too, there are quite a few well-established, professional psychological tests published and used online, as well as amateur ones. It sometimes takes an expert to differentiate between professional and amateur tests, hence the problems for lay people are obvious.

More complicated assessment techniques, such as those that require human interaction for interpretation and scoring, can also be found on the Net. For instance, the pictures of the Rorschach inkblot test may be presented at a certain website, and patients may record or write down their responses, which will later be handed in to a therapist. It is also possible, and might be feasible, to conduct such assessments using real-time video conferencing systems, electronically replicating the interactive situation that might have occurred in a traditional setting. A still more advanced method is possible (and yet rarely used): Stories told following exposure to Thematic Apperception Test (TAT) pictures may simply be typed into a predesigned form, under each picture; when test-takers finish writing their stories they submit the form with a click of a mouse. A clinician thus

receives a patient's forms through email to enable efficient assessment. Volcani (2000) reported a sophisticated online projective test, based on principles close to the TAT, that proved to be a useful measure of personality. A similar procedure can be used with a sentence-completion test. Drawing software, although widely available, seems unfit for this medium to be used with drawing tests (e.g., draw a person, draw a family, draw a tree), because the user's behavior is not as spontaneous and free as it is in offline testing. Obviously, these types of tests must be private and secure because of clear privacy issues, in addition to copyright considerations. Using a secure, password-protected website seems to meet these conditions to a large extent.

Just as open-ended questions are included in paper-and-pencil tests and questionnaires, they may also be included in online tests and questionnaires. Although their evaluation may be conducted as though they were submitted on paper, digitized materials have the great advantage of the potentiality of being assessed through computer-based procedures (Shermis & Burstein, 2003). Answers to open-ended questions in questionnaires, as well as essays, may be quickly, efficiently, and more objectively scored following preassigned procedures. This method, however, lacks the *qualitative* component of human impression, just as it is still impossible for a computer to rate the quality of artwork.

NONTESTING ONLINE ASSESSMENT PROCEDURES

Although testing online is widespread and appears to be considered to be the most efficacious Internet-related assessment procedure, it is certainly not the only procedure available. Efficient, variegated online communication channels, on the one hand, and the characteristics of the very online environment, on the other, enable other online assessment procedures. These procedures add a unique value to the use of the Internet as an aid in evaluating people and provide a breakthrough in developing distance appraisal.

The Internet may be exploited to conduct assessment interviews, through text only, by using the computer's sound capability (i.e., a conversation involving the computer's microphone and speakers), or through video (i.e., by using webcams). An Internet-based interview is particularly useful when interviewee and interviewer are at a great distance from each other, because travel time and expenses are saved. Telephone interviews for assessment purposes are possible and actually used, too (e.g., Blackman, 2002; Paulsen et al., 1988), although limited in validity (Cacciola et al., 1999; Silvester et al., 2000). Interviewing through the Net has, however, two special advantages: (a) a conversation may easily be saved for further evaluation; (b) the cost is very low. These special advantages may justify online interviews, at

least for initial screening or preliminary diagnostics. Emerging video technologies and recently enhanced communication speed make online interviews not only doable but also quite efficient. However, as with online therapy (Maheu & Gordon, 2000; Manhal-Baugus, 2001; Suler et al., 2001), special professional training, adherence to special ethical guidelines, and advanced equipment are necessary to make online assessment interviews efficient and valid. Diagnostic interviewing through the Internet is an exciting method to gather psychological information on a person. As mentioned above, although phone interviews have the critical disadvantages of the lack of eye contact and of observable nonverbal cues, online synchronous video technology might lessen this shortcoming. Research in applying this method in actual assessment procedures (Yoshino et al., 2001) has shown that high-speed Internet communication technology can produce highly efficient, reliable interviews. Still, an interview based on chat or instant messaging is also possible, particularly in cases in which written script—both for analyzing its content and for detecting characteristic online behavior—may be sufficient to evaluate a person (Leung, 2002; Peris et al., 2002). This verbal-only method might at times even be preferred to the use of video communication, because the lack of eye contact contributes to growing personal exposure (e.g., Duggan & Parrott, 2000).

Another method of exploiting the Net for assessment and evaluation purposes has to do with evaluating resumes and biographical information. Because documents can easily be transferred online, it seems obvious that psychologists receive material this way rather than in the traditional, printed manner. Indeed, such attempts have proved useful (e.g., Coffee, Pearce, & Nishimura, 1999). However, other sources of personal information can be included in this category: personal websites, which often contain a great amount of private details and expressions (Döring, 2002); weblogs (blogs)—online personal diaries that record even more intimate experiences; and poems, stories, and artwork published on the Internet. All these sources of highly significant psychological input may be analyzed and evaluated by clinicians for the benefit of a client or for improved professional appraisal.

In addition, the Internet allows assessment of another aspect of people's behavior: observations of interpersonal interactions in both synchronous and asynchronous environments. Based on the premise that people's behavior online more accurately reflects their real personality, because of the online disinhibition effect (Joinson, 1998, 1999, 2001; Suler, 2001), a close observation of people's (text-based) behavior in chat rooms and forums, as well as in instant messaging and email, can provide important psychological information. Although this information is limited in scope and context, it may contribute to better understanding one's interpersonal pattern in a group or dyadic situations. In the context of personnel selection, simulative environments can be created online parallel with observing people's group behav-

ior in a situational test (e.g., McDaniel & Nguyen, 2001; Weekley & Jones, 1999), to evaluate social interactions in a challenging circumstance. Observing behaviors on the Internet may lead to special information because of the unique characteristics of cyberspace that prompt disinhibitions. Thus, online observations in a chat room or a forum may serve as a significant source of psychologically relevant information, perhaps even more valid than interpersonal behaviors in f2f situations. Similarly, group dynamics in online situations (McKenna & Green, 2002; Sassenberg, 2002; Suler & Phillips, 2000) can disclose significant information about people's various personality characteristics that might be important for therapy. A clinician can benefit from observing patients' behavior in online environments, either a chat room or a forum, and in identifying their typical responses. Taking into account the online disinhibition effect, one can strongly argue that this information contributes significantly to the diagnosis of patients.

One caveat here is the idea that the personae people present online might be constructed or contrived to some degree. There has been speculation (e.g., Suler, 2000; Turkle, 1995) that the Internet can be used as a laboratory for identity exploration, and that people may construct or express different selves online. Clearly, this needs to be considered when using the actions of an online persona as a source of data about the person "behind the screen." However, given evidence that people's online personae are likely to be influenced by their "real" personalities (for instance, Buchanan & Smith, 1999, found evidence suggesting that the personality trait of self-monitoring was associated with whether or not people chose to use a "handle" or screen name when posting to Usenet newsgroups), observation of online behavior is likely to be a useful source of information as long as one remembers that the context of the behavior may affect its nature.

ADVANTAGES OF ONLINE PROCEDURES FOR PSYCHOLOGICAL ASSESSMENT

Relative to traditional personal assessment in the context of counseling and psychotherapy (e.g., paper-and-pencil testing), online assessment offers quite a few strengths and advanced features that make it attractive. These advantages—professional and administrative alike—are enabled by the special characteristics of online communication and by technological developments. Nevertheless, they are flexible enough to be amalgamated into traditional counseling (and, naturally, into online counseling). Following is a discussion of several of the principal advantages of online assessment, both those pertaining to testing and those that are related to other assessment procedures.

One of the main advantages of using the Net in general, and for testing in particular, is its elasticity (i.e., flexibility); namely, the absence of con-

finement related to time and place (Barak & English, 2002; Sampson, 2000; Sampson et al., 1997). In a traditional testing session, test-takers have to take a test in a particular place and at a particular time. This strict condition has now been overcome, because test-takers may take a test at any time and in any place where a computer is connected to the Internet (e.g., equipped, usually, with basic software). Not only, then, can test-taking conditions become more convenient to test-takers, but the test-taker can also initiate taking a test when he or she feels comfortable with this tiring and usually anxiety-provoking activity (e.g., Tseng et al., 1997). Thus, positive personal feelings and sufficient measurement validity are both enhanced. Practically, clinicians may assign eligible tests to patients, by providing them only with URLs. Results could be electronically sent to clinicians' email as well as to patients', as required. Obviously, if necessary, tests might be taken in the clinic, at designated computers, thus saving the clinician or test administrator time. For example, a client may take an online instrument, such as the Keirseley Temperament Sorter II, assessing the constructs of the Myers-Briggs Type Indicator (see Kelly & Jugovic, 2001) for immediate scoring, results, inferences, and referrals to related information.

Another important advantage of online assessment relates to accuracy of raw scoring and standardization conversion. Because these two operations are performed by software, human errors are avoided; hence, the scores obtained are accurate and better reflect test-takers' true scores. This is a clear contribution to the reliability of measurement. For instance, it was found that scoring a simple career-related inventory, such as the Self-Directed Search (SDS; Holland et al., 1994), where just "yes" responses have to be counted and totaled, is affected by numerous human errors (Elliott & Byrd, 1985). A computerized version of the SDS was developed and it eliminated these errors (McKee & Levinson, 1990). However, using an *Internet-based* version of the SDS (at <http://www.self-directed-search.com>), which liberates the user from obtaining the SDS software, can also easily avoid such errors and consequent erroneous interpretations (Barak & Cohen, 2002).

Another advantage of machine-based scoring of online tests is the speed both of scoring and of obtaining results. With computer-based tests, this stage usually takes a few seconds, with results fed back to test-takers and/or to counselors immediately, saving tension and frustration (Mooney, 2002).

A special advantage relates to saving test-takers' scores, whether for storage for further clinical use or for any kind of research. The use of digital technology enables data to be saved in preexisting and preset software (e.g., Excel) or merely in test-takers' personal files. A therapist thus can retrieve clients' tests—including item responses, raw scores, or normative data—for any clinical use quickly and easily. Moreover, statistical analyses can be done relatively simply and data entry saved.

Still another important advantage of online assessment relates to the test version being up to date. In using an online test, especially if it is at a website

provided by the test publisher, we can make sure that the most recent, updated version of any given test is in use, not an obsolete one. Related to this, changes in instructions, scoring, and norms are automatically applied to online tests through the testing software located on a server and do not have to be distributed, learned, and supervised with individual users (Barak, 1999; Barak & English, 2002). This last consideration is an important matter that is commonly overlooked when using traditional testing at a given agency, because the version used is the version at hand.

One last significant advantage refers to assessment methods other than testing. In online interviewing, through commonly used voice- and picture-enabled systems, the advantage is not only that interviewee and interviewer may be at a distance from each other and each at a convenient location; and it is not only that the interview may easily be saved for later inspection and appraisal. Another important positive aspect is that the interviewee's behavior might better reflect his/her true personality characteristics, as mentioned earlier, because of reduced inhibitions. This factor may significantly contribute to the validity of the psychological assessment.

DISADVANTAGES OF ONLINE ASSESSMENT RELATIVE TO TRADITIONAL METHODS

It is clear that online assessment procedures have much to offer. However, there are also drawbacks that must be considered before they are used. One of the questions that bothers many professionals in regard to online assessment has to do with the testing condition. That is, should a test-taker be allowed to take tests while in solitude (usually at home), in contrast to the traditional method that requires the presence of a test administrator (or a psychologist). One set of possible disadvantages, therefore, relates to diminished control over the testing situation.

Psychometric tests are designed to be administered under controlled, standardized conditions. This may well not be the case in Web-based assessments. People might complete assessment instruments under varying conditions: In different locations (e.g., late at night in the peace of their own home, or in the bustle of a busy Internet café), under different physical (e.g., alert, tired or intoxicated, alone or in the presence of others) or psychological (e.g., relaxed, distressed, bored, mischievous) conditions. One has no way of knowing whether any of these conditions apply to a particular instance of assessment. In some applications (e.g., proctored assessments for educational or occupational purposes), one may be able to instruct respondents to complete tests under certain conditions, to use computers situated within a clinic, or to ask them about the conditions under which they completed the questionnaire. In other applications (e.g., mass screening, or on self-help sites) this is not realistic. It has been argued (see Reips, 2000) that this variance in assessment context might lead to *greater*

ecological validity. However, if assessment results are to be used for any important purpose, one needs to establish that results have not been affected by this lack of standardization (or that the effect is a systematic one that can be considered when test outcomes are interpreted). Although there is sufficient evidence that online and paper-and-pencil versions of tests can measure the same constructs to suggest that results will usually be valid (see Barak & English, 2002), there are also sufficient indications of (usually small) differences to indicate that this is an issue in need of further research (Buchanan, 2002).

In nonproctored assessment situations, there is also an issue over the identity of test-takers. Test-takers, when alone, may cheat, misrepresent themselves, or even allow others to take a test for them. This is probably more a concern in high-stakes occupational assessments (e.g., cases of assessing of candidates for a desired job, study program, and the like), for which the motivation to cheat is obvious (Bartram, 1997, 1999). In a psychotherapeutic framework, however, this problem becomes redundant, on the assumption that a patient has a genuine desire to cooperate positively with the clinician. The common solution is to allow test-takers to complete tests in a place (and time) of their choosing only if there is no apparent motivation to cheat. Otherwise, online tests may be taken only in a monitored office, whether individually or in groups, or under circumstances where identities can be verified. There are ways in which identity can be established (e.g., social security numbers; credit card details). However, it is an open question as to whether this will affect some of the phenomena alleged to operate in online assessments, specifically, increased self-disclosure due to anonymity (see Buchanan, 2002).

This leads to another set of issues, related to the psychological effects of different testing situations. There is a growing literature on online psychological assessment, primarily related to its use in research and occupational testing. This includes a number of projects conducted with the aim of establishing whether particular online tests were psychometrically and functionally equivalent to offline measures on which they are based. Results from such studies, and extrapolation of findings from the large body of research on computer-mediated communication (CMC), have suggested that certain characteristics of the assessment medium, such as reduced social cues, deindividuation, or changes in where attention is focused, may influence the way people respond to online tests.

CMC research (e.g. Kiesler et al., 1984; Walther, 1996) has indicated that when people interact via computers, their communication may be disinhibited to some extent, and as we have already indicated, this effect appears to extend to online communication (see Joinson, 1998, 1999, 2001; Suler, 2001), hence our earlier suggestion that people's online behavior might reflect their "real personalities" unfettered by normal social constraints.

Disinhibition effects have traditionally been discussed (and researched) in terms of “flaming”—hostile communications—but also seem to influence the degree to which people are willing to disclose personal (and often very sensitive) information. Simply put, people seem to disclose high levels of personal information when interacting on the Internet (Joinson, 2002). There are strong indications that people may reveal more about themselves to an online questionnaire than in an f2f context, although at the time of writing we are not aware of any direct empirical test of this suggestion (Buchanan et al., 2002b).

There is also evidence that people may respond in less socially desirable ways to online questionnaires: Joinson (1999) randomly assigned college-student participants to complete (among other instruments) a social desirability questionnaire either via the Internet or in a paper-and-pencil format. Social desirability scores were lower for the group tested via the Internet. This finding has been interpreted as evidence that people will be less influenced by social desirability concerns when completing online assessments: they may feel free to express socially disapproved aspects of their identities. On the other hand, they may also feel less constrained to provide the information requested by the assessor (Buchanan et al., 2002b).

Possibly as a function of these phenomena (or perhaps of the idea advanced by Bargh et al., 2002, that people are more able to express their “true selves” on the Internet), a number of studies have reported differences between online and offline respondents, who did not appear to differ in any way other than the medium used to assess them, in mean scores on several instruments (e.g., Barak & Cohen, 2002; Davis, 1999; Fouladi et al., 2002; Joinson, 1999). There are some suggestions that this is the case with respect to measures related to negative affect (in that people report higher levels of negative affect when tested online). If correct, this has clear implications for clinical assessment. In any case, it is an issue on which more research is clearly needed.

One of the implications is that normative data should not be used in interpreting scores obtained with online clinical inventories. This assertion is based on the fact that the vast majority of normative data available will have been gathered offline. Buchanan (2003) has shown that using offline norms may lead to very serious errors of judgment about the meaning of a particular score achieved using an online psychological test (e.g., in the case of one set of data presented, use of offline norms would have led to misclassification of 18% of the sample). Clearly, this objection would not apply to normative data gathered online: in that case, one would be comparing the score of an individual with data from the appropriate population. The difficulty here is the heterogeneity of that population: it is possible that one may be called upon to assess people from different cultures or countries (or even *in* other countries). Will appropriate data be available under those circumstances? In the case of screening instruments (e.g., on self-help sites),

how does one ensure that the correct norms are used and correct feedback given to the individual? These issues led Buchanan (2003) to suggest that online tests should not currently be used in a manner requiring use of normative data, and their main utility would be in applications that did not require such comparisons to be made (e.g., monitoring change during therapy, ipsative measures, such as the SDS). This is a situation that is likely to change, as online tests become more widely used; normative data accrues, and the mechanisms that might affect responses become better understood.

Another potential drawback to online assessment is the current lack of regulation and quality control. In the case of standard offline assessment procedures, a number of mechanisms exist to ensure at least a minimum standard of quality and professionalism. For example, in many countries publishers of psychometric tests adhere to standards developed by bodies such as the International Test Commission (International Test Commission, 2001) and require evidence (e.g., a recognized qualification in testing, or attendance at a course run by the publisher) of competence before they will sell a test to an individual. Most people with access to assessment procedures and the opportunity to use them will have had appropriate training, and in most cases will also be members of a professional body with a code of ethics and disciplinary procedures for anyone found to have acted inappropriately.

This will extend in part to online assessment procedures: those involving commercially published psychometric instruments, or employed by trained, qualified therapists. However, a large proportion of the assessments being conducted over the Internet (e.g., via self-help or personality testing sites) do not meet these criteria, and numerous examples of very bad practice can be found (e.g., invalid instruments, data stored without informed consent, misleading information, potentially distressing feedback) (Oliver & Zack, 1999).

Editors' Note: It is important for readers to remember that not all sites and services offering assessment online are the same. Users would be wise to explore and get more information about the sources they are using, with a particular focus on understanding the ways in which information is collected, transmitted, stored, and used.

ETHICAL AND LEGAL ISSUES

Codes of ethical conduct for psychologists typically include some statement to the effect that psychologists should only use procedures that are fit for their purposes. For example, the section of the current American Psychological Association (APA) ethics code dealing with assessment states,

“Psychologists base the opinions contained in their recommendations, reports, and diagnostic or evaluative statements, including forensic testimony, on information and techniques sufficient to substantiate their findings” (APA, 2002). This statement was explicitly reconfirmed in regard to online psychological activities, including online assessment (APA, 1997). This principle applies both to therapeutic interventions (which should be evidence-based and empirically supported) and to assessment procedures (which should actually measure the intended constructs).

Relatively little is yet known about the efficacy of online counseling procedures (see Laszlo et al., 1999; Maheu & Gordon, 2000; Manhal-Baugus, 2001), although emerging studies (see Ström, Petterson, & Andersson, 2000; Andersson et al., 2002) and work presented in this volume add significantly to that knowledge base. Relatively little is also known about online assessment. Despite numerous indications that they can work successfully, factors that may affect the validity of online tests still require much more investigation. In this sense, there is a great burden of responsibility on people conducting online assessments to ensure that their tools are fit for their purposes. Unfortunately, many of the “tests” currently available on the Web are likely to be manifestly unfit for any purpose whatsoever, lacking any evidence of reliability or validity. These include measures developed by (well-intentioned) amateurs who are not aware of psychometric issues, and professionals who are aware of psychometric issues but have not fully considered the possible effects of using a new testing medium. Given that many “end users” of online assessments will be unaware of the quality of the test they are using, this may create problems, especially in the (many) situations where feedback is given to users (see also Barak, 2003, for discussion of a parallel situation with career-related assessments where people may make wrong career decisions on the basis of flawed feedback).

One possible use of Internet-mediated assessments is for self-exploration and personal development purposes: as already indicated there are a wide range of instruments available for this purpose, and the popularity of self-testing websites indicates that people are using them. The primary incentive to take a test under such circumstances is to obtain feedback, which the test-taker may then use for various purposes (including making life decisions).

This makes it very important for people constructing online tests to ensure that the information is accurate, and that it will not have a negative effect on test-takers. Accuracy can only be ensured by using assessment techniques of demonstrable validity and by making comparisons with appropriate normative data if required (e.g., when informing someone how their scores on a screening inventory compare to those of other people). The majority of sites presenting online tests do (appropriately) print a disclaimer of some sort, advising people not to place too much reliance on the test results. However, it is an open question whether such disclaimers have much impact, given the strength of the well-known “Barnum effect.” The

Barnum effect is the tendency of people to accept test feedback composed of high base-rate personality traits as descriptive of themselves, even if the feedback is fictional (Anastasi, 1997). Research is required to establish whether people actually do believe feedback from online tests, and to assess whether inappropriate feedback might have any negative effects on their lives. It is also possible that test feedback might have immediate negative effects, irrespective of any action people take based on it. It has been shown that fairly minor mood manipulations in Internet experiments can influence people's emotional states (Goritz et al., 1999). How might people react to feedback indicating that their level of intelligence was "well below the population average"? Or that they had a pattern of scores which had some negative implications for their physical or mental health? Or that they had a high score on some socially undesirable construct (e.g., psychoticism)? These issues might have an especially large impact on people with problems or low self-esteem: exactly the kind of people who might be seeking mental health help or information on the Internet.

This observation also applies to use of online tests by psychologists for diagnostic purposes and is a reason why there might be reservations about their unsupervised use. The very taking of a psychological test might itself create a detrimental situation. This may result from the client experiencing stress while taking the test, as well as with an unexpected negative evaluation in cases where immediate results are provided to test-takers, which is a common procedure in many tests published on the Internet. Therefore, being an unaccompanied test-taker might potentially be painful and even harmful. A solution to this problem is to use a computer stationed in a clinic to take Internet-based tests, so that immediate support is available. Another possible solution to provide support when needed, even if a test-taker is in solitude, is through the phone or synchronous online communication. Clearly, such support is easier to provide within established therapeutic relationships than in cases of mass-screening or self-help sites.

Issues related to the remote provision of mental health services must also be considered. One of the great advantages of behavioral telehealth is that services can be provided for people in other locations. This is also an area of potential difficulty, especially given the "emergent" nature of Internet law.

In some areas, there are local or national laws relating to telehealth provision. However, there is evidence that a high proportion of behavioral telehealth providers are unaware of (or misunderstand) local legislation that applies to them (Maheu & Gordon, 2000). Maheu and Gordon also found that a high proportion of practitioners provided services to clients in other jurisdictions (in their study, other U.S. states). If one extrapolates this to the (realistic) scenario of people providing assessments to people in other countries, it is clear that there may be legal issues one needs to consider. What recourse might a client have in the case of malpractice (e.g.,

giving misleading or damaging feedback from an online assessment) by a remote practitioner? What legislation applies regarding the secure transmission and storage of data, and access rights to it?

Security of data transmission and storage must also be considered. Much has been made of the “hacker threat,” or risk of unauthorized interception of or access to test data by third parties. The extent to which this is a problem is open to debate. On the one side, it is certainly possible. For example, Reips (2002) observes that configuration errors or certain data transmission techniques result in possibly confidential data being openly available via the WWW in the case of online psychological experiments, and that this happens frequently. Given that psychologists constructing such experiments are likely to be among the more technically proficient and “Internet savvy” members of the profession, this is a worrying finding. This may cause a problem for online counseling applications if Maheu and Gordon’s (2000) prediction that many therapists, who are not computer experts, will find themselves forced to adopt new technologies is correct. On the other side, the extent to which there really is a problem may be exaggerated. Yes, it is possible to intercept data transmitted via computers. It is also entirely possible—and probably easier for most people—to tap a telephone, listen outside a therapist’s door, break the lock to a “secure” filing cabinet, and so on. The risk is therefore probably no greater than in traditional assessment contexts (Barak & English, 2002). We are not aware of any incidents where the “hacker threat” has been anything other than a hypothetical problem, so although it is an issue people should be aware of, it is possible that its practical importance is low.

SUMMARY

The current chapter attempts to cover the wide spectrum of issues relating to Internet-based psychological assessment. No doubt, the Internet has provided psychology with a revolutionary vehicle through which methods of assessment of people—for therapeutic purposes, for appraising a person’s suitability for a study program or a job, and for self-exploration—are changing. Thanks to the typical characteristics of the Net—availability, affordability, accessibility, acceptability, and aloneness—its exploitation as a tool that enables efficient testing and assessment is inviting. Perhaps the Internet’s central advantages for assessment are its flexibility in terms of time and place, provision of quick and accurate scoring, availability of textual information and Web links pertaining to the nature of the assessment results, central control of updating test versions, and Internet-based nontesting assessment methods. Furthermore, because of the special communication characteristics of people who use the Internet, such as anonymity, invisibility, asynchronicity, and lack of eye contact, human inhi-

bitions diminish; more candid responses may be anticipated as a result, thus elevating the validity of the assessment.

Although online assessment is useful and valuable, there are several precautions that have to be taken as well. Perhaps the most problematic issue is that many amateur tests are published on the Net, and naive surfers cannot differentiate between a professional, validated assessment website and a nonprofessional one. There is some evidence to suggest, as was pointed out, that the measurement of specific dimensions online might possibly be erroneous, and perhaps assessments of some people, or people in certain circumstances, might be biased. We made a special point of the issue of providing assessment feedback online, and of the potential harm this could cause if done badly.

Online assessment is a young area. Many issues and questions are being raised and only a few answers based on empirical research can be given to date. Until knowledge based on much practice and massive research is accumulated, we should be cautious in routinely applying online assessment. Intensive investigations are needed to provide reliable answers to questions regarding basic issues, such as questions related to converting traditional tests to online versions, providing feedback to test-takers online, performing chat-based interviews, using synchronous and asynchronous environments as a means of behavioral assessment, and more. In addition, we encourage raising public awareness and understanding of online tests so people will know what to expect and what not to expect, thus obviating potentially harmful situations. We also call for the training of professionals in Internet-related assessment, to provide them with new and advanced tools, on the one hand, and to make them aware of their shortcomings and limitations, on the other.

KEY TERMS

Deindividuation: A psychological process characterized by reduced self-evaluation and decreased inhibitions in crowd situations.

Disinhibition: Abolition or reduction of psychological mechanisms that govern spontaneous behavior.

Ecological validity: The degree to which findings obtained from research in controlled situations might be generalized and found relevant under other circumstances and more natural environments.

Factor structure: The basic main dimensions or psychological constructs underlying responses to a given test.

Myers-Briggs Type Indicator (MBTI): A well-known, widely used personality assessment test based on Jung's typology of personality.

Normative data: Statistical parameters of a comparison group by which an individual person's test results are analyzed.

Qualitative: Based on subjective analysis and impression rather than objective, measured assessment.

Projective test: A psychological test in which people are asked to respond to ambiguous stimuli (e.g., pictures, unfinished sentences). Responses are interpreted as expressing the desires and needs of the individual.

Psychological assessment: A set of various procedures, including verbal and nonverbal intelligence measures, written and performance tests, interviews, appraisal of group behavior, and more, used to evaluate a person's personality and various traits.

Psychometric properties: Quality of measurement of a psychological test, assessed by several factors, such as reliability and validity.

Reliability: The degree to which a test consistently measures a trait or construct.

Rorschach inkblot test: A projective test in which symmetric ink stains are presented to people who are asked to describe what they see in them.

Social desirability: A general trend of people to do and say things so others value and like them.

Thematic Apperception Test (TAT): A projective test that is based on creating personal stories stimulated by given standard pictures.

Validity: The degree to which a test measures the concept it is supposed to measure.

STUDY QUESTIONS

1. What are the main advantages of online psychological testing over traditional testing?
2. What are the main disadvantages of online psychological testing compared with traditional testing?
3. What practical and ethical problems may be encountered when using online psychological assessment?
4. Other than simple testing, what additional techniques are available on the Internet for the purpose of psychological assessment? What are their pros and cons?

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